



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,952	10/02/2003	Haoren Zhuang	14580-038001	7296
20985	7590	04/27/2005	EXAMINER	
FISH & RICHARDSON, PC 12390 EL CAMINO REAL SAN DIEGO, CA 92130-2081			ECKERT II, GEORGE C	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 04/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

274

<b>Office Action Summary</b>	Application No. 10/678,952	Applicant(s) ZHUANG ET AL.	
	Examiner George C. Eckert II	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 March 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3 and 5-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/4/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment dated March 10, 2005 in which claims 1, 3 and 8 were amended, claims 2 and 4 canceled and claims 9-12 newly added has been entered.

### ***Drawings***

2. The drawings were received on March 14, 2005. These drawings are acceptable.

### ***Specification***

3. Objection to the disclosure is overcome by applicant's amendment.

### ***Claim Objections***

4. Claim 8 is objected to because of the following informalities: the amended claim cites "electrodes elements" in several places which should be --electrode elements--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. Claims 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 8, the limitation "the electrically conductive material" lacks antecedent basis and the limitation "electrically conductive elements" seems to be recited twice. In claim 9, the element "support material" lacks antecedent basis.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 5-9, 11 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by 2003/0098484 to Kim. Kim teaches in figures 1-3B a method of making a vertical ferrocapacitor structure comprising:

forming electrode elements 150 over a substructure 100, the electrode elements being in electrical contact with electrically conductive elements 105 which extend into the substructure; and

depositing ferroelectric material 165 (para. 0057) between the electrode elements, thereby forming a layer covering the sides of the electrode elements (fig. 2f);

depositing electrically conductive material 180 over the ferroelectric material into gaps between the electrode elements; and

removing the electrically conductive material and ferroelectric material above the electrode elements so that the ferroelectric material is arranged as layers formed on the lateral sides of the electrode elements (Kim teaches the layer 180 is planarized, para. 0060).

Regarding claim 5, Kim teaches that the electrode elements 150 are formed over an insulating layer 115 containing openings, the electrodes contacting the conductive elements 105 of the substrate through the openings. Regarding claims 6 and 7, the structure of Kim's figure 1

Art Unit: 2815

is a device formed by the method as claimed and comprises a ferrocapacitor. Regarding claim 8, Kim teaches the claimed structure including that the ferroelectric element is formed on the lateral sides of the electrodes. Regarding claim 9 as best understood, Kim teaches that the layers are planarized (para. 0060). Regarding claims 11 and 12, the limitation "acts as a dummy electrode" is a functional limitation which may be performed by the structure of Kim; also, the electrode elements 150 are electrically connected with components of the substructure (via elements 105, para. 0026).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over '484 to Kim in view of 6,699,725 to Lee (of record). Kim taught the method of claim 1 but did not expressly teach that the ferroelectric layer is etched to reduce its thickness. Lee teaches (col. 4, lines 57-64) that a ferroelectric layer may be etched to reduce its thickness. Kim and Lee are combinable because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to etch the ferroelectric layer of Kim as taught by Lee. The motivation for doing so, as is taught by Lee, is that such thinning by etching will provide a more planarized surface (col. 8, lines 63-64). Therefore, it would have been obvious to combine Kim and Lee to obtain the invention of claim 3.

Art Unit: 2815

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over '484 to Kim in view of applicant's admitted prior art. Kim taught the method of claim 9 but did not expressly teach that a layer of  $\text{Al}_2\text{O}_3$  was formed on the planarized flat surface. Applicant's admitted prior art teaches in figure 5 a layer of  $\text{Al}_2\text{O}_3$  (23) over a planarized flat surface of a prior art capacitor. Kim and Applicant's prior art are combinable because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form a layer of  $\text{Al}_2\text{O}_3$  on the surface of Kim. The motivation for doing so, as is known in the art, is that such a layer provides passivation and protection for the underlying capacitor structure. Therefore, it would have been obvious to combine Applicant's prior art and Kim to obtain the invention of claim 10.

### *Response to Arguments*

9. Applicant's arguments with respect to claims 1 and 8 have been considered but are moot in view of the new grounds of rejection.

### *Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after


Art Unit: 2815

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Eckert II whose telephone number is (571) 272-1728.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**GEORGE ECKERT**  
**PRIMARY EXAMINER**